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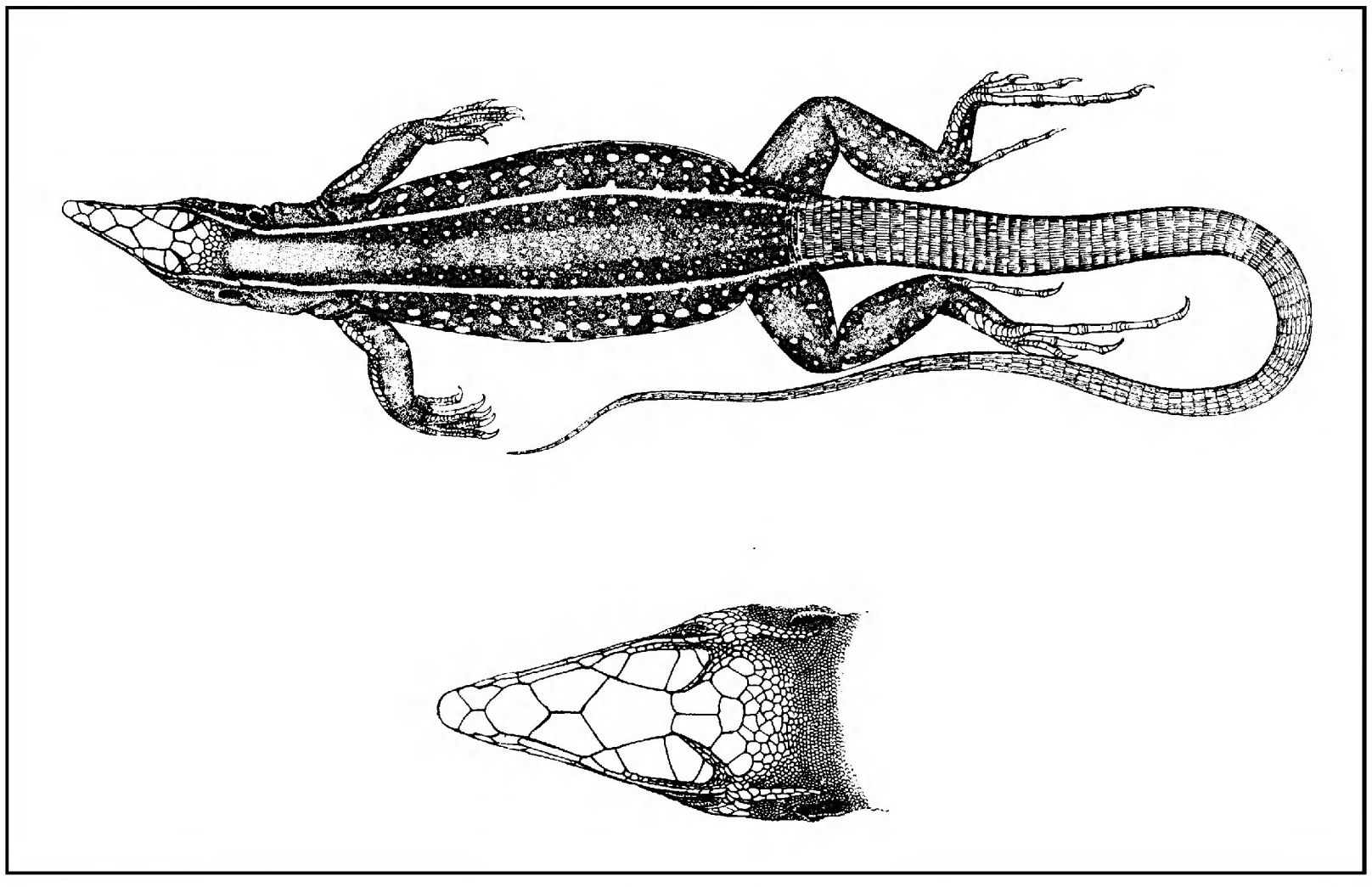

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Herpetofauna of Illinois Audubon Society's Lusk Creek Tract, Pope County, Illinois, with Comparisons to Thompson (1972)

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Abstract

I evaluated the composition of the amphibian and reptile fauna of Illinois Audubon Society's Lusk Creek Tract in southeastern Illinois using terrestrial and aquatic visual encounter surveys, coverboard sampling, and aquatic trapping. I made a total of 322 observations of 24 species of herpetofauna (11 amphibians and 13 reptiles) during 14 field days between August 2009 and June 2010. I encountered anurans most frequently (8 species, 201 observations), followed by snakes (6 species, 37 observations), turtles (4 species, 20 observations), lizards (3 species, 37 observations), and salamanders (3 species, 27 observations). A previous vertebrate survey of upper Lusk Creek (Thompson, 1972) yielded 27 herpetofaunal species, 21 of which I also observed during my survey.

Introduction

In April 2007, the Illinois Audubon Society (IAS) purchased a 23-hectare tract in Pope County, southeastern Illinois (T11S, R6E, E ½ of NW ¼ of Section 27). Because the property is an in-holding within the Lusk Creek Wilderness Area, Shawnee National Forest, its purchase by a conservation organization presents an opportunity to protect and manage the site consistent with wilderness values. The tract contains a variety of habitats including rocky intermittent streams, a perennial stream (Lusk Creek; shallow, rock-bottomed portions and deep, sand/silt-bottomed portions), sandstone bluffs and glades, forested (oak [*Quercus* spp.]–hickory [*Carya* spp.]–sugar maple [*Acer saccharum*]) rocky slopes, grass–shrub fields, and riparian canebrakes (*Arundinaria gigantea*).

From 15 June through 15 September 1967, Thompson (1972) conducted a survey of vertebrates inhabiting the Lusk Creek corridor from Eddyville Road upstream to the vicinity of Little Bear Branch (a distance of approximately 10.7 stream-km). His survey area included 0.4 km on either side of Lusk Creek. Thompson's 1967 survey was part of a flurry of scientific investigations conducted in the upper Lusk Creek corridor by Southern Illinois University at Carbondale (SIUC) faculty and students in the mid-1960s (Ashby, 1969). At that time, the integrity of the Lusk Creek ecosystem was threatened by a proposed dam on Lusk Creek approximately 7.25 km SSE of Eddyville (Ashby, 1968). The dam would have created an impoundment approximately 983 ha in extent (Ashby, 1969). The northern end of Thompson's (1972) survey area was near the upstream end of the predicted high water level of the impoundment, approximately 3.5 stream-km downstream of the IAS property.

Herpetofaunal survey and collection methods employed by Thompson (1972) include: 1) search (including turning logs and rocks) and seize by hand or tongs, 2) stunning by shooting with a large rubber band (lizards), 3) shooting with dust shot from a .22 -caliber pistol, and 4) trotline fishing (turtles). Thompson (1972) documented 27 species of herpetofauna (13 amphibians and 14 reptiles) in the vicinity of upper Lusk Creek. The objectives of my survey included: 1) determine the composition of the amphibian and reptile community occupying the IAS Lusk Creek tract, and 2) compare my observations with those made by Thompson (1972). Taxonomic nomenclature follows Phillips et al. (1999).

Survey Methods and Data Treatment

Prior to initiation of field work, I acquired a list of 59 species of amphibians and reptiles known to occur in Pope County from the Illinois Natural History Survey website (www.inhs.uiuc.edu accessed 20 August 2009). I obtained two additional Pope County species records by examining the Geographic Distribution section in the 1999–2009 issues of *Herpetological Review* (Regester et al., 2002; Shasteen, 2006). Presently, a total of 61 species of amphibians and reptiles is documented from Pope County (59.8% of the 102 herpetofaunal species known to occur in Illinois). However, due to the relatively small size of the IAS tract and limited number of habitat types, I would not expect all 61 species to occur on site. I made nine visits to the tract on the following dates: 23 August 2009; 12–13 September 2009; 20–21 October 2009; 31 March–1 April 2010; 13 April 2010; 25 April 2010; 15–16 May 2010; 26 May 2010; 8–9 June 2010.

Visual Encounter Surveys: I conducted visual encounter surveys by visually scanning terrestrial and aquatic habits (with the aid of binoculars for distance viewing and a flashlight for investigating crevices in bedrock and gaps between embedded rocks and soil), as well as by examination of the undersurface of rocks and logs, and artificial cover objects. I conducted undersurface examination of natural cover objects both terrestrially and aquatically. I replaced displaced cover objects.

On 20 October 2009, I placed eight artificial cover objects (i.e., coverboards) in a grass-dominated field within 5 m of forest edge. I placed coverboards 10 m apart and arranged them, north–south, as follows: 1) sheet of corrugated roofing tin (0.65 m × 2.45 m); 2) sheet of corrugated roofing tin; 3) plywood board (1.9 cm thick, 0.25 m × 1.6 m); 4) sheet of corrugated roofing tin; 5) plywood board (0.6 cm thick, 0.5 m × 1.2 m); 6) sheet of corrugated roofing tin; 7) wood board (2.5 cm thick, 0.3 m × 2.2 m); 8) plywood board (0.6 cm thick, 0.45 m × 1.2 m).

I released all amphibians and reptiles following capture. I identified species visually or, in the case of some frog species,

aurally. I tallied all individuals observed or heard, except for anuran larvae which were often too abundant to realistically count (e.g., *Bufo* tadpoles). In cases of brief sightings (e.g., salamander or lizard eluding capture or frog leaping into water), I recorded genus (i.e., *Apalone* sp., *Eurycea* sp., *Eumeces* sp., and *Rana* sp.). *Apalone* sp. was either smooth softshell turtle (*Apalone mutica*) or spiny softshell turtle (*Apalone spinifera*), *Eurycea* sp. was either two-lined salamander (*Eurycea cirrigera*) or longtail salamander (*Eurycea longicauda*), *Eumeces* sp. was either five-lined skink (*Eumeces fasciatus*) or broadhead skink (*Eumeces laticeps*), whereas *Rana* sp. could have been bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans*), or southern leopard frog (*Rana sphenocephala*).

On 25 May 2010, nine students from the SIUC herpetology class helped me survey Lusk Creek for mudpuppies (*Necturus maculosus*). Lusk Creek was relatively high and swift flowing, providing ideal conditions for kick sampling. Holding fine-mesh d-frame dipnets or a 1 m × 1 m fine-mesh kick net downstream of large rocks or riffles, we kicked through riffle-rocks towards the nets or lifted large rocks and stirred the area beneath. Displaced animals were swept by the current into the nets.

Trapping: I surveyed Lusk Creek for turtles and mudpuppies using two different trap types. I surveyed for mudpuppies using baited, 43 cm × 23 cm rectangular, 3-mm nylon mesh minnow traps having 5-cm diameter interior funnel openings at each end. I baited each trap with canned sardines which I placed into film canisters drilled with holes. I set eight traps in pools one day and removed them the next. Traps were completely submerged in September and October 2009 when snake activity was low. In May 2010, submerged traps were set only in deep pools to reduce the likelihood of capturing snakes. In June 2010, the upper ¼ of all traps remained above the water surface. I employed eight traps on the following dates: 12–13 September 2009; 20–21 October 2009; 15–16 May 2010; 8–9 June 2010 (four times overnight for a total of 32 trap-nights).

I trapped for turtles in deep pools using a baited 2.54-cm mesh, 76.2-cm diameter, single-throated hoop net and a baited 2.54-cm mesh, 55.9-cm diameter, double-throated hoop net. I baited hoop nets with whole fish or sections of large fish tied to the rearmost hoop. The top of the back end of each hoop net was above the water surface so captured turtles had access to air. I set the two nets in pools one day and removed them the next. I employed traps on the following dates: 12–13 September 2009; 15–16 May 2010; 8–9 June 2010 (three times overnight for a total of 6 trap-nights).

Comparison with Thompson (1972): Thompson (1972) did not provide (except for five species) the number of individuals of each species he observed. Instead, he assigned each a descriptor of relative abundance: "common," "uncommon," or "rare." He did not, however, describe what criteria he used to assign these designations. He also noted the distribution of each species as 1) "generally distributed" (defined as "occurring throughout, in most habitats") or 2) "locally distributed" ("occurring in only select spots or habitats"). Given the relatively small size of my survey area, I do not describe distribution. Because the frequency of observations of amphibians and reptiles is influenced by factors such as time of year, weather, breeding biology, and survey method, I did not attempt to assign an abundance rank to the species I observed. Rather, I provide number of observations of each species in tabular form, along with Thompson's (1972) abundance and distribution designations. Because I did not capture and mark individuals, I may have counted some individuals more than once.

Results and Discussion

I made 322 observations of 11 species of amphibians and 13 species of reptiles on-site (Table 1), and detected two additional species in the vicinity. The species observed nearby (wood frog [*Rana sylvatica*] and eastern garter snake [*Thamnophis sirtalis*]) may also occur on the Audubon tract. I detected all species occurring on the Audubon property visually except spring peeper (*Pseudacris crucifer*) and gray treefrog (*Hyla chrysoscelis*). I detected spring peepers by call only and gray treefrogs by call and the presence of egg masses. The number of amphibian species inhabiting the Lusk Creek tract is likely limited by the paucity of lentic (nonflowing) aquatic breeding sites (e.g., ponds). The only lentic aquatic habitats available for breeding are backwater pools in Lusk Creek, pools in the intermittent streams, and temporary pools on the glades. All of these pools, however, are subject to transformation to swift-flowing waters following rain events.

The species of amphibians and reptiles observed are typical of habitats occurring on the Lusk Creek tract. The species most commonly observed (≥ 11 observations) include American toad (*Bufo americanus*), bullfrog, green frog, longtail salamander, slimy salamander (*Plethodon glutinosus*), fence lizard (*Sceloporus undulatus*), ground skink (*Scincella lateralis*), ringneck snake (*Diadophis punctatus*), and northern water snake (*Nerodia sipedon*) (Table 1). Frequent observations of these species do not necessarily translate to greater abundance than other, less frequently observed species. Their perceived abundance may reflect greater detectability rather than greater population size.

Thompson (1972) observed 13 species of amphibians and 14 species of reptiles (Table 1). Although our species lists overlap considerably, we each detected species that the other did not (Table 1). When including species I observed both on and off the Lusk Creek tract, my amphibian list is nearly identical to that of Thompson (1972). The single exception is the spadefoot toad (*Scaphiopus holbrookii*). Thompson captured a single spadefoot in a snap-trap set for small mammals (Thompson et al., 1968).

Thompson (1972) observed two species of lizards and four species of snakes that I did not encounter (Table 1). Thompson (1972) described the six-lined racerunner (*Cnemidophorus sexlineatus*) as "locally common along gravel roads and other dry stony regions" and the broadhead skink as "locally rare around dead trees, wood piles, etc." Given their localized distribution, it is possible that neither of these species occurs on the Audubon tract. On the other hand, one or more of the unidentified *Eumeces* I observed could have been broadhead skinks. Copperheads (*Agkistrodon contortrix*) were described by Thompson (1972) as "generally common along rocky outcrops." He deemed racers (*Coluber constrictor*) and eastern garter snakes to be "generally uncommon throughout." Thompson (1972) observed a single rat snake (*Elaphe obsoleta*). I am perplexed by my lack of copperhead sightings as the habitat I searched appears ideal. I did see one eastern garter snake nearby, off-site. Racers and rat snakes have large home ranges (Carfagno and Weatherhead, 2008), so the chance of encountering

Table 1. Number of observations of amphibians and reptiles made during a 23 August 2009 through 9 June 2010 survey of IAS Lusk Creek tract and during a 15 June through 15 September 1967 survey along upper Lusk Creek by Thompson (1972). Taxonomy follows Phillips et al. (1999). See text for explanation of Thompson's (1972) abundance and distribution categories.

Species	2009–2010 survey	Thompson (1972)
Salamanders		
Eurycea cirrigera (two-lined salamander)	2	LC
Eurycea longicauda (longtail salamander)	11	LC
Eurycea sp.	1	
Plethodon glutinosus (slimy salamander)	13	GC
Frogs		
Acris crepitans (cricket frog)	8	GC
Bufo americanus (American toad)	70	LU
Bufo fowleri (Fowler's toad)	5	GC
Hyla chrysoscelis (gray treefrog)	4	LU (1)
Pseudacris crucifer (spring peeper)	3	LU (1)
Rana catesbeiana (bullfrog)	23	GC
Rana clamitans (green frog)	16	GC
Rana sphenocephala (southern leopard frog)	2	GC
Rana sylvatica (wood frog)		LU
Rana sp.	70	
Scaphiopus holbrookii (spadefoot)		LR (1)
Turtles		
Apalone spinifera (spiny softshell turtle)	1	GC
Apalone sp.	2	
Chelydra serpentina (snapping turtle)	6	GC
Terrapene carolina (eastern box turtle)	4	GC
Trachemys scripta (red-eared slider)	7	
Lizards		
Cnemidophorus sexlineatus (six-lined racerunner)		LC
Eumeces fasciatus (five-lined skink)	1	LC
Eumeces laticeps (broadhead skink)		LR
Eumeces sp.	5	
Sceloporus undulatus (fence lizard)	16	GC
Scincella lateralis (ground skink)	15	GC
Snakes		
Agkistrodon contortrix (copperhead)		GC
Coluber constrictor (racer)		GU
Carphophis amoenus (worm snake)	6	
Diadophis punctatus (ringneck snake)	15	
Elaphe obsoleta (rat snake)		1
Lampropeltis getula (common kingsnake)	3	1
Nerodia sipedon (northern water snake)	11	
Storeria occipitomaculata (redbelly snake)	1	
Thamnophis sirtalis (eastern garter snake)		GU
Virginia valeriae (smooth earth snake)	1	GC
Total species	24	27
Total individuals	322	

either species on the relatively small Audubon tract during a short-term survey may be small. Suitable habitat for both species occurs on the Audubon property so both may inhabit the tract in small numbers.

I encountered one species of turtle and four species of snakes that Thompson (1972) did not observe (Table 1). Due to their habit of basking frequently, the presence of red-ear turtles (*Trachemys scripta*) is usually readily determined. For example, most (57%) of my red-ear turtle observations were of basking or swimming individuals. I frequently encountered worm snakes (*Carphophis amoenus*) and ringneck snakes beneath rocks, and northern water snakes in Lusk Creek. Given that Thompson (1972) lifted rocks and logs, and surveyed for turtles and fishes in Lusk Creek, it is surprising that he did not observe these three species of snakes or red-ear turtles. Worm snakes and ringneck snakes move to moist microhabitats, including deeper into the soil, as the soil dries during the warmer months (Orr, 2006; Smith, 1961). In Illinois, soil moisture typically decreases from spring through summer (Hollinger and Isard, 1994). Thus, it is plausible that these two species were deep underground during the summer of 1967. Redbelly snakes (*Storeria occipitomacula*ta) may also have been underground and unattainable during summer of 1967. I observed only one redbelly snake, swept up with debris on an old cabin floor by former landowner, Mike Maynard.

My survey and that of Thompson (1972) each have biases that likely affected what species, and how many individuals of each species, we encountered. Because Thompson's (1972) survey was restricted to the summer months, he did not encounter spring-breeding anurans during their breeding season. Spring-breeding amphibians often congregate at breeding sites in large numbers for a relatively brief period. This, I believe, explains why the species I encountered most frequently (American toad) was described by Thompson (1972) as "locally uncommon." Although I infrequently encountered American toads in the uplands (5.7% of observations), I counted 66 adults at breeding pools on a glade and in Lusk Creek on 1 and 13 April 2010, respectively. Thompson (1972) may also have been distracted by his responsibilities to survey other vertebrate groups, limiting his survey effort for amphibians and reptiles. The principal limitation of my survey was geographic; I surveyed a relatively small area. Both surveys would have benefited from longer survey periods (including multiple years) and the use of additional survey techniques.

Two species, one previously observed on-site (timber rattlesnake [*Crotalus horridus*]; Mike Maynard, personal communication, 2009) and the other observed downstream in Lusk Creek (mudpuppy; Shasteen, 2006), were not encountered by Thompson (1972) or myself. Both species are listed as state-threatened in Illinois, and both can take considerable effort to detect. Timber rattlesnakes (and the other aforementioned large snake species) are likely transitory inhabitants of the Audubon property. The sandstone glades and blufftops appear to provide suitable basking areas for gravid female timber rattlesnakes. Mudpuppies may not be common in upper Lusk Creek. Shasteen (2006) encountered only one individual during many hours of least brook lamprey (*Lampetra aepyptera*) surveys (Brooks Burr, personal communication, 2009).

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Notes on the Distribution of *Ambystoma tigrinum* in Maryland and Virginia

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The status of the tiger salamander, *Ambystoma tigrinum*, in most Atlantic seaboard states has been stated to range from undetermined to endangered (e.g., Committee . . . , 1973; Bruce, 1977; Martof et al., 1980; Zappalorti and Johnson, 1982; Travis, 1992; Mitchell and Reay, 1999; Gibbs et al., 2007). In Pennsylvania the species is considered extirpated, if indeed it ever occurred there (McCoy, 1982; Williams, 1985; Hulse et al., 2001). Therefore it is especially important that information on this species be accurate. This article corrects errors and notes discrepancies that have appeared in the literature concerning *A. tigrinum* in Maryland and Virginia. Museum abbreviations refer to the following collections: CM (Carnegie Museum of Natural History); FMNH (Field Museum of Natural History); NHSM (Natural History Society of Maryland); NHSM/HSH (Natural History Society of Maryland/Herbert S. Harris, Jr.); UF (Florida Museum of Natural History); USNM (National Museum of Natural History, Smithsonian Institution); UTEP (University of Texas at El Paso).

Stine's (1984) report on the natural history of the tiger salamander embodies virtually all that is known about this species in Maryland. This paper is based on intermittent to fairly intensive field work undertaken by Stine and his associates from 1952 to 1984, and covers all aspects of the species' ecology. With the exception of long-term professional studies on the box turtle, *Terrapene carolina* (Stickel, 1978, 1989; Stickel and Bunck, 1989; Hall et al., 1999; Henry, 2003), and the rat snake, *Elaphe obsoleta* (Stickel et al., 1980), no other species of herpetofauna in Maryland has received as much attention for such a lengthy period. However, unlike the box turtle and the rat snake, *A. tigrinum* is apparently quite rare in Maryland with, at the time of Stine's publication, only seven active breeding sites and only one considered healthy. This salamander has been on the state's endangered species list almost since its inception in 1972 (Committee . . . , 1973). Given this, it would seem particularly desirable to strive for accuracy in all published information.

The following corrections and criticisms are confined to the first five pages of Stine's paper, which deal primarily with the distribution of the species in Maryland.

Three reports of *A. tigrinum* in Maryland are not dealt with by Stine. No mention is made of Cooper's (1953) tentative report of egg masses near Cedarville State Forest, which straddles the Charles County–Prince George's County boundary. Cooper states this three times, while noting the definite occurrence of the egg masses of *A. maculatum*. While citing others (but notably not Cooper, 1960, 1965; Harris, 1969; or Committee . . . , 1973) for overlooking his (Stine's) Somerset County record (discussed below), an odd criticism given that he had not previously published it, Stine has himself overlooked another Somerset County record. Reed (1956, 1957a, b) mentioned an individual from 4.0 mi (6.4 km) W Princess Anne. This was apparently an observation related to Reed by a landowner on whose property Reed had conducted field work for a number of years. Although Reed's herpetological publications have generally been ignored (e.g., Cooper, 1960) or mentioned only to criticize his more egregious errors (Conant, 1958; Cooper, 1959, 1969; Miller, 1993), Stine still should have dealt with this locality. A third site overlooked by Stine was a plotting at or near Price, Queen Anne's County, by Harris (1969, 1975) and Committee . . . (1973). H. S. Harris, Jr. (personal communication) was unable to account for this locality.

A mass of confusion surrounds Stine's (1984) Somerset County record. He states that he and H. Campbell (Howard W. "Duke" Campbell) found an egg mass "one mile north of Westover" on 24 February 1953. Campbell (1961), based on Cooper (1960), reported nine new county records for Somerset County. One of these was for *Rana sylvatica*, based on eggs collected "nr. Westover" by C. J. Stine and him, also on 24 February 1953. Campbell did not list *A. tigrinum*. If this was an oversight, it was a significant one, since it would have been a new county record (following Cooper, 1960). Further obscuring the matter, Stine et al. (1954) state that on 24 February 1953 they (Stine, Fowler and Simmons or some combination thereof) were at Golts and Massey, Kent County; this is approximately 130 km N Westover, Somerset County. No mention is made of finding *A. tigrinum* in Somerset County by Stine et al. (1954), nor does Campbell's name appear in this publication. In addition, Stine (1953) does not mention or map the tiger salamander in Somerset County, although he maps the Charles County locality (near La Plata) at which he and J. A. Fowler found larvae on 27 May 1953 (Stine et al., 1954; Stine, 1984). This was three months after the alleged finding of eggs near Westover. Stine's Somerset County locality appears to be based on a false memory, and until hard evidence becomes available *A. tigrinum* should not be considered as properly documented from this county.

Other errors and oddities appear in the introductory material to Stine's paper. There is a comment on the distribution of the tiger salamander in the adjacent state of Virginia (Funderburg et al., 1974), but no mention of the species' status in the other bordering states of Delaware, Pennsylvania and West Virginia. Both Stine et al. (1954) and Stine (1984) have misstated one or both of the dates that J. A. Fowler collected *A. tigrinum* eggs in Caroline County. The correct dates are 17 March 1946 for Federalsburg and 31 March 1947 for Hollingsworth Crossroads (J. A. Fowler, personal communication). The locality data for the Massey site is overstated, the route number for the Bishopville, Worcester County, locality is erroneous, and an article by Miller (1980) commenting on the Anne Arundel County specimen should have been cited. Harris (1966) is cited; this article has no bearing on *A. tigrinum*. Presumably Harris (1969) is what was intended. A citation of a one-sentence note by Franz (1972) contains three errors and raises another issue. Stine

(1984) states: "On June 15, 1972 L. R. Franz and D. S. Lee (Franz, 1972) documented the presence of *tigrinum* at Massey, collecting 11 mature larvae. These specimens are preserved in the Florida State Museum (FSM [UF is the correct abbreviation] 39087-39097)." Franz reported collecting three (not 11) larvae on 17 (not 15) June 1972; D. S. Lee is not mentioned. Further, Stine miscites Franz (1972); his name is not listed properly, nor is the issue number recorded correctly. Similar errors are rife in Stine's cited references. The implication that Franz and Lee were the first to document the occurrence of *A. tigrinum* at Massey, Kent County, is quite strange. The tiger salamander was collected at Massey [actually about 2.0 mi (3.2 km) E Massey] at least as early as 3 May 1952 by Stine's long-time colleague, J. A. Fowler [CM 137983 (4 larvae)] and by Fowler and Stine (CM 137982) on 24 January 1953. Although Fowler's private collection was not transferred to the Carnegie Museum until 1994, Stine was certainly aware of it. Since that time, *A. tigrinum* has been collected near Massey on numerous occasions from 1959 through 1971. Specimens documenting the presence of the tiger salamander near Massey are NHSM 3438-3439; NHSM/HSH 41, 44, 78, 246-247, 365 (discarded), 366, 394, 395-396, 401, 541; FMNH 208649-208656, 208658-208659, 208661, 208665-208670, 208674-208675 and UTEP 9888 (14 larvae). At the very least, Stine should have been familiar with the holdings of the Natural History Society of Maryland. In addition, Stine does not mention the private collection of his other long-time colleague, R. S. Simmons. Simmons collected 11 tiger salamander larvae near Massey on 27 May 1952 (RSS S49—discarded; NHSM files).

Concerning Funderburg et al. (1974), the authors state that two egg masses from Hanover County, Virginia, the first report of the species from the state with specific locality data, were deposited in the Natural History Society of Maryland. This did not occur. Pague and Mitchell (1987) do not mention the locality. Mitchell and Pague (1987) list it among their "Unverified observations" and erroneously call it *A. jeffersonianum*. Pague and Buhlmann (1991) state that this site "is unsubstantiated (there are no specimens or photographs)." Mitchell and Reay (1999) wrote that this locality "is based on an unidentifiable egg mass now in the Virginia Museum of Natural History." According to Funderburg et al., the identity of the eggs was verified by D. S. Lee. Since Lee has considerable experience with *A. tigrinum* (Lee, 1975, 2006, 2007a; Lee and Franz, 1974), the rejection of this locality by these authors appears to be unwarranted.

Lee and Franz (1974) cited Stine et al. (1954) as the sole reference to *A. tigrinum* in Maryland, but overlooked numerous publications, the most important being Netting (1938) and Committee . . . (1973). Others include Conant (1945), Mansueti (1947), Stine (1953, 1954), Cooper (1953, 1960, 1965), Reed (1956, 1957a, 1957b), Hardy and Mansueti (1962), Harris (1969), Franz (1972, 1973) and Hertl (1973).

In the course of Lee's (2006; expanded 2007a) entertaining denunciation of the Maryland Department of Natural Resources for its culpability in the probable extirpation [in his view, which he modified in Lee (2007b)] of the last known population of *A. tigrinum* in Maryland, a few mistakes appear. He states that the tiger salamander "was not even mentioned" in "Norton" (Norden) et al. (1984). In fact, Norden (1984), on page one, paragraph two, states that Stine (1984) had already been published. Elsewhere in Norden et al., *A. tigrinum* is mentioned by Taylor (1984) and Brosnan (1984). Oddly, Lee does not list Stine (1984) in his references. He also erroneously credits Stine as "one of two amateur herpetologists who first discovered the species [*A. tigrinum*] in Maryland in the 1950s." Thirty-one years earlier Lee (1975) made the same error. Actually, Netting (1938) first reported the tiger salamander from Maryland, based on a specimen (USNM 89904) collected at Vienna, Dorchester County, in February 1933.

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Book Review: *The Last Tortoise: A Tale of Extinction in Our Lifetime* by Craig B. Stanford 2010. 240 pp. Belknap Press of Harvard University Press, Cambridge, Massachusetts ISBN-13: 978-0674049925 Hardcover $23.95*

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Warning—this book is not for the faint of heart. Craig Stanford presents a wonderful introduction to tortoises and the adaptations that have allowed them to populate extreme habitats around the globe and to persist through the great extinction of the dinosaurs. But more than half of the book is dedicated to an explanation and review of the current forces at work which may cause tortoises to be the first family of vertebrates to become extinct in the 21st century. Luckily for readers, Stanford concludes with a blueprint for hope and case studies which illustrate how we can prevent the disappearance of these fascinating and awe-inspiring animals.

Stanford begins by outlining the dire circumstances facing tortoises, and why we should care about tortoises. He posits that from the time that he writes the book to the time that it reaches bookstores, there may very well be a few tortoise species which are pushed into extinction. However, he also makes that point that extinctions are almost always preventable. Stanford ends this piece by referring to Aesop's fable, *The Tortoise and the Hare*, a story familiar to us all, and in which the tortoise beats the hare in a race through persistence and slow, steady progress. Stanford asks if, because of the same characteristics, a slow, steady pace of life and of reproduction, the tortoise will lose the race for survival. Whether or not this might be true is explored in the remaining chapters.

Chapter 1 provides a brief review of tortoises and turtles for those who are already familiar, and an introduction to those who are not. What's different about this introduction or review is the beautiful language and metaphors used to describe turtles and tortoises, and the obvious affection that Stanford feels for these animals. He goes into depth describing the various adaptations that turtles have for living in the plethora of habitats they reside in, and includes a history of the tortoise dating back 220 million years. Stanford introduces the tortoises themselves by functional groups. He then closes this chapter by presenting two reasons why we should care enough to take action to save tortoises. The first has to do with tortoises' astonishing adaptations that have made them one of the most successful groups of animals on Earth. The second has to do with the roles that tortoises may serve in ecosystems as seed dispersers, soil aerators, primary consumers of plants, scavengers, and as prey for other animals.

Stanford focuses on the longevity and life history attributes of tortoises in the second chapter. This includes the link between number of eggs laid by a tortoise and the tortoise's size. It also focuses on the very small probability that a neonate has to survive to adulthood but the great likelihood of adult survival in the absence of humankind. Stanford closes the chapter with conservation techniques and their effectiveness. He includes an explanation for "head-starting" in terms of its effectiveness for conservation, and reminds us that "head-starting" will not replace addressing causes of adult mortality in tortoise populations, but that it may be helpful in cases where numbers of adults are already so low that population supplementation is necessary.

The next four chapters present the major threats to tortoises and examples of how each threat impacts specific species. In Chapter 3, the emphasis is on habitat loss and habitat degradation or fragmentation. The drive for industrial and residential development in the West and the drive for agriculture and harvest of forests in developing countries has resulted in a near-complete loss of habitat for some tortoise species. In addition, the potential for disease transmission among individuals when tortoises are moved is discussed, particularly in terms of impacts to desert tortoise populations in the American southwest.

Chapter 4 discusses threats to tortoises from human consumption. There is great emphasis on the current practice in Asia, particularly China, but Stanford includes a chilling history of turtle harvest and consumption in the United States in the 19th and early 20th centuries. Hardest hit perhaps, in the United States, were diamondback terrapins, which sold for up to $10 apiece in the mid-1800s. Eventually, the rareness of the species led to a major decline in harvest effort, although thousands are still sold in areas where there are large Asian migrant communities. Stanford closes the chapter with a critique of "turtle farming" for food.

In Chapter 5, Stanford discusses the "island giants," animals which once existed in many tropical ecosystems but which are restricted to just a few islands today. The first part of the chapter is devoted to the giant tortoises of the Mascarene chain, including Mauritius. Next, Stanford presents the Galápagos

tortoises, and the harsh circumstances in which they were able to survive prior to human exploitation of the islands. The story of Lonesome George, the last known living tortoise from the Pinta Island race of Galápagos tortoises is recounted. However, there's a new twist to his story, with the discovery of partial DNA matches with tortoises living on Wolf Volcano on Isabela Island. Stanford closes the chapter with a discussion of restoration ecology and the often troubling decision as to what time period you are trying to restore an ecosystem, which is more a question of values than science.

Chapter 6 discusses the threat that collection for the pet trade poses to tortoises. Stanford elucidates the reasons for people's attraction to tortoises and desire for them as pets. He highlights the fact that tortoise species are desired in direct proportion to their rarity, despite the price tag and illegality of possessing them. And he traces the history of humans keeping turtles. Unfortunately, many tortoise species are not easy to keep. And some such species are present in the pet trade despite being listied by CITES, which presumably should protect them from collection pressures. Stanford closes the chapter with a best-case scenario for captive breeding of tortoises by private individuals that could lead to a reduction in the pressure to import wild stock, and perhaps in some cases reintroduction of species back to their original habitats.

Chapter 7 offers us a blueprint for hope in terms of tortoise survival. Perhaps Stanford's most powerful statement appears on page 165. "As always, both extinction and preservation from extinction are human issues, not animal issues." If we are the problem, we must also be the solution! Stanford outlines a couple of case studies which offer hope, and highlights the contributions of Peter Pritchard and other heroes of tortoise conservation, including private breeders. And even suggests that giant tortoises could be reintroduced into some of the areas in which they once roamed, including Florida—wouldn't that be something?

The Last Tortoise is a "must read" for anyone who enjoys turtles and tortoises, but particularly for those of us who have an inordinate fondness for animals with shells, and want to share them with our great-great-grandchildren.

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What You Missed at the September Meeting

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September's meeting featured a team of two speakers. They are both veterinarians with established and prospering practices. In spite of rumors to the contrary, neither is anticipating a quick retirement. They both have extensive experience with treating reptiles and amphibians. They are both accomplished photographers who have traveled the world scuba diving and field herping. They are both excellent field herpers who are slowed by few obstacles and discouraged by nothing. Their enthusiasm is contagious. One climbs like a mountain goat and the other carries thirty pounds of camera gear. They have traveled to many places in the US and around the world, including, fairly recently, the Antarctic and the Arctic where they have captured penguins and polar bears (respectively) on camera. They have known each other and been friends for decades, and both have been involved with your society for decades. I have had the pleasure of knowing them for about ten years, and have been able to field herp with them on numerous occasions. They live right here in the Chicago area. We didn't think that their trips to the Arctic or Antarctic would be herp-centered enough to make a good presentation (pictures of herps that they didn't see?), but they've recently returned from a trip to Ecuador and the Galápagos Islands, so we begged them for a presentation. It was worth the wait.

Gery on the left and Steve on the right. Photograph by Dick Buchholz.

Drs. Gery Herrmann and Steve Barten split the presentation. Gery, being somewhat laconic, gave the introduction and ended with some very interesting videos, and Steve, more accustomed to public speaking, did most of the talking. These guys don't just show pretty pictures. By the time we left the meeting we had a good idea of the philosophy behind a tourist lodge in Ecuador, the origins of the name of a small town, some history of the Galápagos Islands, descriptions of the efforts that Ecuador takes to mitigate human impact on the islands, some taxonomy of Galápagos tortoises, descriptions of many of the animals that often included interesting behavioral observations, and videos of animals doing those behaviors. The audience felt as if we were taken on a tour of Ecuador and the Galápagos lead by experts.

Gery introduced the presentation by describing when and how they traveled. Touring under the auspices of the North American Veterinary Conference, they spent three nights in the jungles of Ecuador before flying to the Galápagos for eight nights of cruising the islands on a ship in June of this year. Unlike their trips to the chills of the Antarctic and Arctic, their wives went along on this expedition and thoroughly enjoyed themselves.

Steve then stepped in, starting with maps locating Ecuador, Quito, Coca, and the Sacha Lodge. Pulling from Google Earth and using PowerPoint to animate the slides, we were treated to a complete picture of where they went and how they arrived. They left the little town of Puerto Francisco de Orellana and traveled by boat fifty miles to the Sacha Lodge. While the town is named after the Spaniard who first came upon the Amazon River, the locals understandably call it just Coca.

Sacha Lodge works hard to improve the lives of the natives. Ninety percent of the staff is local. Medical care is provided, as well as free boat passage (the only way) to and from Coca. The lodge has three metal towers linked by rather rickety-appearing suspension bridges that challenged Steve's natural savoir-faire, since the railings seemed to only reach mid-thigh. As we stared at a pictured of another tower looking like a stack of pick-up sticks, Steve posited that OSHA agents were probably not regular visitors. The climb was worth it since one is able to observe life in the canopy from those heights, and photos showed us not only the gorgeous views but also the enraptured tourists. The lodge was not exactly primitive. The rooms were screened but otherwise open, the water fit to drink, and the food delicious. Days were begun with a 6 AM wakeup, 7 AM breakfast, and a 7:30 departure on the trails. Nothing ever dried, and the importance of plastic bags to keep things dry was stressed.

Photograph by Stephen L. Barten.

The first herp seen at the lodge was a juvenile spectacled caiman (*Caiman crocodilus*), and it received the justly deserved aaahs from our audience. Flourishes of cyan and scarlet, lemon and lime, iridescence and camouflage were flashed in front of us

One of Steve's favorite finds, a caiman lizard (*Dracaena guianensis*) and to the right, one of the reasons he likes these lizards. Those teeth are used to crush the snails that make up most of their diet. Photograph by Stephen L. Barten.

from birds and bugs, botany and primates, and spiders and lizards. To show why it's one of his favorites, Steve went to the trouble of digging up a picture of a skull to accompany his photo of a caiman lizard (*Dracaena guianensis*). The powerful crushing teeth would have no trouble dispatching the snails that make up most of its diet. An Ecuadorian salamander (*Bolitoglossa equatoriana*) and a Christmas treefrog (*Hyla punctata*) represented some of the amphibians, and terrific shots of leaping squirrel monkeys, cute black-mantled tamarins, and red howler

Photograph by Stephen L. Barten.

monkeys were juxtaposed with spiders, thorny tree trunks, and NSFW tree roots. Sound effects from the audience varied between ooohs and aaahs to yucks and ughs, always intermingled with giggles and guffaws. For me one highlight was a hoatzin. Since this is a herp article, I'll just say it's an extraordinary bird that's probably worth googling. Perhaps the find of the trip was a ringed blue caecilian (*Siphonops annulatus*). I suspect that very few people have seen these in the wild, and if I ever do I'll brag about it much more than Steve, but his pictures made me feel as though I had seen it. Ninety pictures, each a treat for the eyes, covered just the jungle portion of the trip. After a brief and cute look at Quito and Otavala, we were transported 600 miles west to the Galápagos.

Anyone with an interest in natural history knows something about the Galápagos Islands, and surely most wish to go. Steve talked of how the Ecuadorian government is trying to mitigate the impact of an increasing number of visitors to these famous islands. All visitors require guides, must follow a specific schedule for their visits, must stay on designated trails, and must not approach the animals. It's OK and not uncommon if the animals approach you. Steve once again researched and provided us with a brief history of the islands and elaborated on threats and the remedies the government is trying to implement. Then he took us on a photographic tour. The pictures were great. We saw lava lizards (*Microlophus* spp.) and lava herons, soaring storm petrels and wading oystercatchers, Galápagos doves and gliding brown pelicans. The bright scarlet throat sacks of the frigate birds caught our attention, and comical pictures of blue-footed boobies brought much laughter. When viewed straight on, it's hard to feel that there is any intelligence in these birds and impossible to avoid laughing. But Steve does more than just show pretty pictures. We were with them as they stepped carefully over land iguanas (*Conolophus* spp.) sprawled across the trail, explored the Charles Darwin Research Station

I want to see one of these in the wild! Ringed blue caecilian (*Siphonops annulatus*). Photograph by Stephen L. Barten.

They weren't exactly roughing it in the Galápagos and the food was great! Photograph by Stephen L. Barten.

She apparently wasn't interested and left the scene without consummating the engagement. Land iguanas (*Conolophus* sp.) Photograph by Stephen L. Barten.

as we learned the history of Lonesome George and the taxonomy of the giant tortoises (*Geochelone* spp.), immersed ourselves in dozens of marine iguanas (*Amblyrhynchus cristatus*) basking on black lava rocks, shared in the pride and wonder of seeing four of the six taxa of snakes on the islands, and felt the sublimity of snorkeling with animals that have no fear of man. Steve took a rather gruesome but excellent photo of a well-aged marine iguana carcass to show us the unique teeth they use to scrape algae from ocean boulders. We were fascinated by pictures of baby iguanas the size of tiger salamanders. Steve mentioned how the nocturnal swallow-tailed gulls use low frequency echolocation and how Wade albatrosses leave their chicks for one to two weeks while they search for food at sea. We saw lots of tortoise pictures as Steve explained the ecological impact of the tortoises and the changing taxonomy of the genus, with the added surprise that genetic testing implies that Lonesome George may be more closely related to the tortoises on a more distant island rather than the tortoises on the island next door. Penguins cavorted and seal lions yawned. Tortoises stretched their necks and sedately chomped on grasses while tourist paparazzi took hundreds of photos. Steve had photos of the famous Darwin finches but admitted that most people couldn't tell the difference without close up and careful examination. A flightless cormorant looked quizzically at the camera as it spread its undersized wings to dry. In his quest to share their experience, Steve even borrowed photos showing a Galápagos

A desiccated marine iguana carcass, showing the really cool teeth used to scrape algae off underwater rocks. Photograph by Stephen L. Barten.

Galapagos tortoise (*Geochelone* sp.) Photograph by Stephen L. Barten.

hawk devouring a baby iguana and several underwater shots of the exotic sea life.

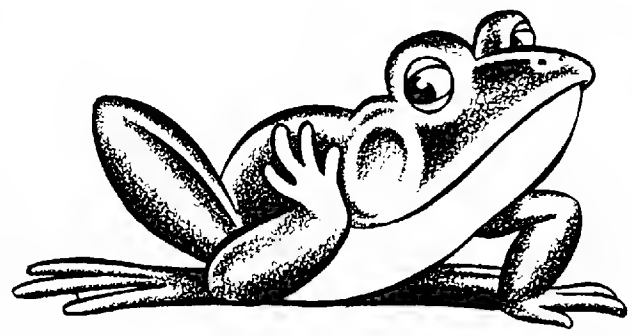
Steve ended his presentation with a stunning sunset shot. The presentation had run a little long, and Gery, almost apologetically, asked if anyone still wanted to watch videos. I doubt that he would have been able to leave without showing the videos, and after an emphatic crowd shout out of yes, we were treated to action films of many of the behaviors exhibited by the animals of the Galápagos. I kept expecting David Attenborough to begin narrating as we watched blue-footed boobies in court ship and giant tortoises munching. We saw marine iguanas swimming for shore to bask and land iguanas attempting to mate while nearly stepping on the toes of tourists. Truly icing on the cake of a terrific presentation.

I said earlier that I've had the pleasure of field herping with these two, so I'd like to add a little information of my own. Both of these gentlemen have a great deal of fun in the field. They are both excellent companions. What their presentation didn't reveal is the tremendous amount of effort they put into their endeavors. While the North American Veterinary Conference expeditions are unquestionably a lot of fun, they are also continuing education opportunities, with lectures and studies that fill much of the time on the trip. They get training in local conservation issues, animal behaviors, treatment for local wildlife and captive breeding techniques. So some of those trips are work. But they don't have to be on a business trip to work hard. In the field Steve takes his photography very seriously carrying a great deal of equipment and Gery roams over ground that few are willing to traverse to find the animals others won't. They certainly have fun herping, but it is only through a lot of extra effort on their parts that we can share some of their experiences. Like many of you, I hope to go to the Galápagos someday, but if I can't, at least I've had a taste of what it's like through the efforts of Dr. Steve Barten and Dr. Gery Herrmann. Nice to have you guys around. Thanks.

Photograph by Stephen L. Barten.

The Tympanum

As a past supporter of the Friends of the Kankakee, we hope that the Chicago Herpetological Society will again consider helping us. FOK has the opportunity to acquire 40 parcels of land totaling 24.25 acres from willing sellers in the Kankakee Sands.



The parcels under consideration include one 4.5-acre lot in Kankakee County that lies within the Leesville Savanna Illinois Natural Areas Inventory site. The remaining 39 parcels are all vacant lots in the Willow Estates subdivision in Beaverville Township, Iroquois County, that are near or adjacent to our current holdings. Of the 746 lots in the subdivision, we have acquired 234, totaling 120 acres more or less. Along with our two large, adjacent tracts (66 acres registered as an Illinois Land & Water Reserve), we are close to connecting Willow Slough in Indiana with Hooper Branch Savanna Nature Preserve and Iroquois County State Wildlife Area.

We are anticipating acquisition costs in excess of $100,000 and are applying for funds from the Illinois Clean Energy Community Foundation. FOK is acquiring several parcels as a match. We need help in any amount to fund these multiple acquisitions over the next year. Your support will also help strengthen our grant request.

We are grateful for the generous help we have received from your organization in the past, and hope that you will look favorably on our current request. **Marianne L. Hahn, President, Friends of the Kankakee, PO Box 13, Watseka, IL 60970. mariannehahn@sbcglobal.net**

Because the current year has not been a good one for the CHS financially, the board has decided against making a donation to Friends of the Kankakee at this time. But FOK is probably doing more than anyone else to conserve the exciting herpetofauna of the Kankakee sand prairies, and we hope that some of our members will consider supporting them.

I am writing to you as a former grant recipient and attendee of your meetings in the Chicago area. I would like to share information with you regarding a project I am developing and in which was indirectly made possibly by your grant.

While conducting my Ph.D. research in central Panama, I became aware of the need for facilities for researchers, students, and general tourists. I also was met directly with the poverty in the surrounding communities. Thus, the idea of La MICA Biological Station was born. We promote conservation of the local environment, culture, and history through education, research, and global outreach. La MICA employs local people in all possible positions, including guides, drivers, cooks, cleaners, and security.

La MICA is now welcoming guests including general tourists. We have a dormitory, a classroom / lounge area, and a bathhouse. All logistics, including delicious meals, local and in-country transportation, and guides or field assistants, are in place.

The area around La MICA is rich in reptiles and amphibians. Omar Torrijos National Park, just 6 km away, is an important field site for chytridiomycosis-induced amphibian declines. Amphibians number over 70 species. We have at least 13 species of anoles, and I have personally documented 61 species of snakes!

I wanted to bring to the attention of your members the opportunities available at La MICA Biological Station. We invite the society or members to make a donation to help in our advancement (we will put your logo and contact information on our acknowledgment webpage when any size donation is made). In fact the University of Wisconsin–Stevens Point Herpetological Society and the Virginia Herpetology Society have already made donations. Furthermore, we invite your members to join our other students, researchers, and general tourists that have already visited to explore our herpetofauna, in addition to the local flora and fauna.

Thank you for your time and I hope you will pass along this information to all members of your organization and your colleagues, family, and friends. More information is available at www.lamica.org and donation information is available at www.lamica.org/Donate.html. **Julie Ray, la.mica@yahoo.com**

Dollars and Sense

The article "Herpetoculture in the 21st Century" by David and Tracy Barker, published in the September 2010 CHS *Bulletin* prompted me to reflect on my 35 years of intense herp keeping. Coincidentally, my compulsion began as a high school freshman, while residing in Crystal Lake, Illinois; the same town in which Dave Barker attended high school. I primarily grew up in Evanston, Illinois, but relocated to Crystal Lake for a brief time. My freshman and sophomore years of high school were completed at Crystal Lake Community High School. For speech class, my major presentation was "How to Properly Handle a Snake." A live, captive garter snake was brought from home and used for the demonstration. The course teacher informed me that several years earlier there was another "snake guy" attending the school. It wasn't until ten years later, at the Columbus, Ohio, International Herpetological Symposium (IHS) that I met Dave Barker, the other C.L.C.H.S. snake guy.

David and Tracy make compelling arguments in their fine article. However, I believe if we are to reflect on the past several decades of herpetoculture in the United States, the "new order" must be addressed. When I purchased my first neonate boa constrictor in 1975, captive propagation of snakes, especially tropical species was not the motivation, and rarely even attempted. The aforementioned IHS was not in existence, and it would be nearly a decade-and-a-half before we read a US periodical dedicated to herps and their care or breeding. The motivation for maintaining and growing this boa constrictor, and

many, many herps to follow was simply one of fascination, education, and enjoyment.

With the ability to propagate captive reptiles and amphibians came a major transformation in the hobby. Simply put, in a very short time, the majority of serious keepers transformed their hobby into a business. The individuals who had been satisfied maintaining and observing a fascinating collection quickly became entrepreneurs. Species of interest in one's collection, even those of many years, were quickly replaced with species of perceived financial value. Herps were (and are now more than ever) being speculated upon like so many Wall Street stocks. Friends and colleagues were dumping entire breeding groups of certain species solely because the price had dropped.

The herp market is driven by supply and demand, and unlike most "merchandise," herps do not appeal to a huge audience. Additionally, the supply is greatly influenced by imported animals. A prime example is the crocodile lizard (*Shinisaurus crocodilurus*). In the early 1980s, this unique lizard was extremely rare in US collections, very expensive, and desired by a great many herpetoculturists. During the mid 1980s, China allowed the export of *Shinisaurus* to the US. For a time, they could be found at pet shops for $35.00. During this period, even though excellent captive care articles were published detailing the requirements of this semi-aquatic species, few if any serious herpetoculturists wanted anything to do with the lizard. Shortly thereafter, the crocodile lizard was granted protection in China, the importation to the US ceased, and many, many herpetoculturists were scrambling to acquire them, willing to pay hundreds of dollars apiece.

For the past couple decades, the driving force behind herpetoculture has been to produce new morphs, "living art" as it has been called. Something that is either extremely rare or does not exist in the wild. This is what provides the big money now in our "hobby." Disturbing trends to produce albino (amelinistic) animals, and even hybrids drive the industry. It must be realized, albinism is an extremely severe genetic defect and weakness, and I have witnessed bizarre physical maladies in amelanistic snakes, which I never observed in the species' normal genetic counterparts.

I do not want to be portrayed as hypocritical. Since 1982, I have owned and operated a herp business, maintain a diverse collection, and as I write this, have red-foot tortoises (*Geochelone carbonaria*) with their heads poking through eggs. However, I intentionally avoid all genetic anomalies, and due to the their desirability in the marketplace, now concentrate on selling herp books, and authoring herp articles and books. I purchased my now adult, breeder red-foot tortoises in 1987, when they were a few weeks old, and grew them for 8 years prior to their reproducing. Reproduction is simply a benefit of excellent captive care, which in northeastern Ohio is much more involved than in warmer climates. The tortoises, and many additional herps are in my collection for the same reason as my first baby boa of 1975: enjoyment, not profit. For decades, I've maintained large aquatic turtles such as the alligator snapping turtle (*Macrochelys temminckii*) individually in several hundred-gallon enclosures, sporting large, expensive filtration systems for the sole reason they provide me enjoyment. They will not be sold, or reproduced.

There remain some others like myself, but we are not the key, high-profile breeders driven by profit. Do the top herpetoculturists producing almost exclusively herp anomalies not found in the wild promote conservation, or aid in preventing the extinction of a species? Today, the private herpetoculturists that maintain a collection of reptiles and amphibians primarily for the enjoyment, study, education, or assurance of the species existence are in the minority. **Dave Fogel, The Herp House, 1750 Haines Road, Orwell, OH 44076. herphouse1@aol.com**

Bull. Chicago Herp. Soc. 45(10):168-169, 2010

Herpetology 2010

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

JAGUARS EATING CAIMANS

R. Da Silveira et al. [2010, J. Herpetology 44(3):418-424] note that the jaguar (*Panthera onca*) is the largest Neotropical felid and in many parts of its range reptiles form a significant but relatively minor component of its diet. However, in the seasonally flooded varzea forests of the Amazon, terrestrial mammals, which form an important component of jaguar diet in other habitats, are largely absent and jaguars switch to alternative prey, including arboreal mammals and reptiles. In the Mamirauá Sustainable Development Reserve in the western Brazilian Amazon, the authors document predation by jaguars on two species of caiman (*Caiman crocodilus* and *Melanosuchus niger*), which are abundant in this varzea habitat. The smaller *C. crocodilus* seems to be particularly vulnerable because of its size and tendency to spend more time on land than the larger *M. niger*. Jaguars not only kill and eat caiman but are also a significant predator on eggs of both species. These findings are placed into the context of jaguar predation on reptiles by reviewing studies of jaguar diet in a variety of biomes.

YOSEMITE TOADS AND NONNATIVE BROOK TROUT

R. L. Grasso et al. [2010, Copeia 2010(3):457-462] note that in the Sierra Nevada Mountains of California, Yosemite toads (*Anaxyrus canorus*) have declined throughout their range where brook trout (*Salvelinus fontinalis*) have been widely introduced. Amphibians that evolved in fishless habitats often lack the necessary chemical defenses and behavioral responses to avoid predation. True toads (family Bufonidae), however, possess noxious chemicals that often deter predators. The goal of the study was to test whether eggs, tadpoles, and postmetamorphic toads of *A. canorus* are a palatable food source for *S. fontinalis*, assess the antipredator behavior of tadpoles of *A. canorus* by exposing them to various predator chemical cues, and determine sublethal effects on three lifestages of *A. canorus* from sampling by *S. fontinalis*. The study found that eggs, tadpoles, and postmetamorphic toads of *A. canorus* exhibit absolute unpalatability to *S. fontinalis*. In addition, tadpoles of *A. canorus* did not exhibit a significant difference in behavior when exposed to chemical stimuli. Moreover, observational experiments revealed that trout would sample, then reject lifestages of *A. canorus* unharmed, while trout readily consumed tadpoles of Pacific chorus frog (*Pseudacris regilla*). The authors therefore infer that early lifestages of *A. canorus* likely possess existing chemical defenses as a result of interactions with native predators that adequately protect them from nonnative trout predation. Although trout removal often leads to the recovery of other Sierra Nevada amphibian populations, trout removal would likely have no effect on populations of *A. canorus* given these results. Therefore, the authors suggest that other factors thought to be contributing toward *A. canorus* decline should be investigated before efforts are concentrated on removing trout from toad habitats.

CHEMICAL PREY DISCRIMINATION BY AN AMPHISBAENIAN

R. V. Semhan et al. [2010, J. Herpetology 44(3):489-492] note tha little is known about the diet of many amphisbaenians and even less about their prey preferences in part because of their fossorial habits. The authors used the tongue-flicking behavior of an amphisbaenian, *Amphisbaena heterozonata*, an apparently opportunistic feeder, to investigate its ability to discriminate among three prey items: termites (fed in captivity), tenebrionid larvae, and earthworms. Sixteen individuals were tested, each being placed in a glass tube, in a room lighted only with a red light to simulate fossorial conditions. Stimuli were presented on cotton swabs impregnated with the smell of a prey, using distilled water as control. Two experiments were conducted: in the first, the amphisbaenians had not eaten one week prior to starting the experiment; and in the second, they had not eaten two weeks prior to it. The number of tongue flicks per minute and latencies to the first tongue flick were recorded. The amphisbaenians made significantly more tongue flicks to termites than to the water control in both experiments. In addition, latencies were significantly shorter toward termites than toward water. Results show that *A. heterozonata* could clearly discriminate, based on chemical stimuli, between termites, one of the prey items they feed on in the field and on which they were fed in captivity, and water. Other comparisons among prey items and the water control were nonsignificant except in two cases during the second experiment. Considering that this species is most likely a generalist–opportunistic feeder, it may be that the response was learned based on its year-long termite-exclusive diet.

RECOVERY FROM ANESTHESIA IN SNAKES

D. L. Preston et al. [2010, Copeia 2010(3):496-501] note that variability in anesthetic effect is frequently observed in individuals within a species, yet few studies have investigated its causes in reptiles. To evaluate potential sources of variability in reptile anesthesia, the authors conducted experiments to test for effects of body temperature, body condition, gravidity, and time post-feeding on the recovery time of red-sided garter snakes (*Thamnophis sirtalis parietalis*) anesthetized with methohexital sodium (Brevital Sodium). The mean recovery time of snakes anesthetized at 21 °C was 125 min, at 26 °C it was 86 min, and at 31 °C it was 64 min. There was a significant correlation between body condition and recovery time, with thinner snakes experiencing longer recovery times. Gravid snakes anesthetized within five weeks of parturition had a mean recovery time that was twice as long as nongravid snakes of a similar mass. Time post-feeding did not have a statistically significant effect on the recovery time in snakes that were anesthetized one, three, and ten days after consuming 30% of their body mass in food. Based on these findings, the authors provide recommendations for producing more predictable results when using methohexital sodium in reptiles.

EFFECTS OF LARGE WILDFIRES ON HERPS

C. J. Rochester et al. [2010, J. Herpetology 44(3):333-351] note that in 2003, southern California experienced several large fires that burned thousands of hectares of wildlife habitats and conserved lands. To investigate the effects of these fires on the reptile and amphibian communities, the authors compared the results from prefire herpetofauna and vegetation sampling to two years of postfire sampling across 38 burned and 17 unburned plots. The sampling plots were spread over four vegetation types and four open space areas within San Diego County. The capture results indicated that burned chaparral and coastal sage scrub plots lost herpetofaunal species diversity after the fires and displayed a significant shift in overall community structure. Shrub and tree cover at the burned plots, averaged across the second and third postfire years, had decreased by 53% in chaparral and 75% in coastal sage scrub. Additionally, postfire herpetofauna community structure at burned plots was more similar to that found in unburned grasslands. In grassland and woodland/riparian vegetation plots, where shrub and tree cover was not significantly affected by fires, no differences were found in the herpetofaunal species diversity or community composition. At the individual species level, *Sceloporus occidentalis* was the most abundant reptile in these areas both before and after the fires. Increases in net capture rates were seen for several lizard species, including *Aspidoscelis tigris*, *Phrynosoma coronatum*, and *Uta stansburiana* in burned chaparral plots and *Aspidoscelis hyperythra* and *U. stansburiana* in burned coastal sage scrub plots. The toad *Bufo boreas* was detected at significantly fewer burned plots in chaparral after the fires. Additionally, the study documented decreases in the number of plots occupied by lizards (*Elgaria multicarinata*), salamanders (*Batrachoseps major*), and snakes (*Coluber constrictor*, *Lampropeltis getula*, *Pituophis catenifer* and *Masticophis lateralis*) in coastal sage scrub and chaparral after the fires. Individual species results are discussed in relation to such life-history traits as the susceptibility to initial mortality, the response to the altered postfire habitat, and shifts in the availability of potential prey. The authors foresee that a continued unnatural fire regime will result in a simplification of the southern California reptile and amphibian communities.

HOGNOSE BODY TEMPERATURES

M. V. Plummer and N. E. Mills [2010 J. Herpetology 44(3): 471-474] measured body temperatures (T_b) of eight free-ranging *Heterodon platirhinos* with radiotelemetry throughout the year. Body temperature ranged from 5 to 37°C and varied with air temperature and activity. During the active season, T_b of active snakes (30.5°C) averaged about 3°C higher than that of inactive snakes (27.4°C). Body temperature did not differ between the sexes or between resident and nonresident snakes. At air temperatures below 30°C, T_b averaged 3°C above air temperature; at air temperatures above 30°C, T_b averaged 0.2°C below air temperature. Basking appears important in the thermal ecology of *H. platirhinos*. Body temperature of free-ranging active *H. platirhinos* monitored with radiotelemetry was similar to previous reports on T_bs of active *H. platirhinos* measured with cloacal thermometers. A thorough knowledge of basic thermal requirements of *H. platirhinos* may be useful in its conservation.

EFFECTS OF COVER OBJECT SPACING

J. M. Schieltz et al. [2010, Herpetologica 66(3):276-282] note that territoriality has been well-documented in terrestrial plethodontid salamanders. However, most studies of territoriality have focused either on defense of single cover objects or on defense of areas of forest floor. In nature, cover objects tend to occur in groups, and little is known about how cover-object distributions affect territory defense and salamander spatial associations. The authors manipulated cover-object spacing within a home range and used mark–recapture data to examine the effects of these manipulations on intra- and intersexual spatial associations in the red-backed salamander, *Plethodon cinereus*. Similar total numbers of salamanders were found in the different treatments, and salamanders moved between cover objects with similar frequency regardless of cover-object spacing. However, male spatial associations were affected by cover-object spacing, with males never found simultaneously under adjacent cover objects. Furthermore, the spatial associations of males and females differed among the cover-object spacing treatments. Males and females shared the same cover object 76% of the time when cover objects were adjacent, but only 37% of the time when cover objects were separated by 1 m. These results suggest that *P. cinereus* often use multiple cover objects within a home range, and that males may defend these while they are using them. Additionally, males and females appear to adjust their use of cover objects with respect to the home ranges of opposite sex salamanders.

COMPETITION BETWEEN TWO TOAD SPECIES

L. S. Vogel and J. H. K. Pechmann [2010, J. Herpetology 44(3):382-389] note that Fowler's toad (*Anaxyrus fowleri*) was historically abundant and widespread in various habitats, including urban and agricultural areas, in southern Louisiana. Coincident with intense anthropogenic disturbance, the abundance of the Coastal Plain toad (*Incilius nebulifer*) has increased significantly in degraded habitats. Subsequently, *A. fowleri* is found only in forested areas near permanent water bodies that are not preferred breeding habitat of *I. nebulifer*. The authors hypothesized that larval competition with *I. nebulifer*, a species that breeds in extremely ephemeral habitat commonly found in disturbed areas, contributed to *A. fowleri*'s decline. They raised tadpoles in intra- and interspecific competition in artificial ponds under simulated permanent and temporary breeding habitat conditions. Competition with *I. nebulifer* tadpoles, but not pond drying, resulted in a decrease in body size measures and a lower rate of survival to metamorphosis for *A. fowleri* tadpoles. *Incilius nebulifer* tadpoles were slightly larger in drying than in permanent ponds and were larger and had a higher rate of survival to metamorphosis in interspecific tanks than in intraspecific tanks, suggesting that it is easier for *I. nebulifer* to outcompete other species than conspecifics. The Coastal Plain toad's superior competitive ability in temporary breeding sites may have resulted in ecological displacement and is potentially contributing to a decline of regionally sympatric populations of Fowler's toad in degraded landscapes.

Unofficial Minutes of the CHS Board Meeting, September 17, 2010

The meeting was called to order at 7:42 P.M. at the Schaumburg Public Library. Board members John Archer, Lawrence Huddleston and Jenny Vollman were absent.

Officers' Reports

Recording Secretary: Cindy Rampacek read the minutes from the August 13 board meeting, corrections were made, and the minutes were accepted..

Treasurer: The financial report was presented, discussed and accepted.

Membership Secretary: Mike Dloogatch read a list of memberships expiring this month.

Corresponding secretary: Deb has been finding tons of turtle calls on the CHS voicemail. Deb is also collecting signatures for a ban against atrazine.

Sergeant-at-arms: The attendance at the August meeting was 47.

Committee Reports

Shows:
• Unity Fest, September 11. Dick Buchholz, Mike Scott and Bob Bavirsha handled this event in Marquette Park.
• Meet the Creek (Salt Creek), Brookfield, September 18
• Snake Days, Milwaukee Public Museum, November 6.

Nominating Committee: Chairman Jason Hood will post the nominations on the CHS forum

New Business

Animal Planet email regarding Animal Hoarders: This is of no interested to the CHS.

Windy City Charitable Games email: No one expressed any interest.

Friends of Kankakee Land Parcel Purchase email: They are currently looking to purchase more property. We plan to post the letter in the *Bulletin* to let our membership know about the need.
Joan Moore has made several donations of items for the raffle as well as returning a batch of herp books that belong to the CHS. Once we learn what we paid for the books we will decide what to do.

Mike Dloogatch moved to authorize Cindy Rampacek to create and post to a user name for the CHS on a new kingsnake.com blog. The motion passed unanimously.

Mike also pointed out that a vote of the members present at a general meeting is needed to confirm the new board positions for Jessica Tschampe and Linda Malawy.

Round Table

BobBavirsha mentioned that the latest alligators out if the forest preserves were much easier to capture without media involvement.

Jessica Tschampa is looking for reptile bones to make into jewelry.

Mike Scott said that the turtle pond at the Little Red Schoolhouse is worth the visit.

Jason Hood and a few CHS friends went up to Wisconsin on Labor Day. They found 8 baby hog-nosed snakes and they had a blast.

Cindy gave a run-down on her summer travels.

Linda recently found newly hatched box turtles in her yard.

Jim Foster visited a pet store in Dixon, Illinois. There was a cockatoo that played fetch and some very cool reptile displays.

The meeting was adjourned at 9:14 P.M.

Respectfully submitted by recording secretary Cindy Rampacek

Advertisements

For sale: rats and mice—pinkies, fuzzies and adults. Quantity discounts. Please send a SASE for pricelist or call Bill Brant, *THE GOURMET RODENT*, 12921 SW 1st Rd, Ste 107-434, Jonesville, FL 32669, 352-472-9189, E-mail: GrmtRodent@aol.com.

For sale: from **The Mouse Factory**, producing superior quality, frozen feeder mice and rats. Our mice and rats are vacuum-packed to greatly extend freezer life by reducing freezer burning and preserving vitamin and nutrient content. We feed our colony a nutrtionally balanced diet of rodent chow, formulated especially for us, and four types of natural whole grains and seeds. For a complete price list please visit our web site, www.themousefactory.com. We accept all major credit cards, PayPal or money orders. Call us **toll-free** (800) 720-0076 or send us an e-mail at info@themousefactory.com. Write us at PO Box 85, Alpine TX 79831.

For sale: **high quality frozen feeders**. Over a decade of production and supply. Seven sizes of mice availabe: small newborn pinks up to jumbo adults. Prices start at $25 per 100. Feeders are separate in the resealable bag, not frozen together. Low shipping rates. Free price list. Kelly Haller, 4236 SE 25th Street, Topeka KS 66605, (913) 234-3358 evenings and weekends.

For sale: Rats—live or frozen. I breed rats for my collection of boas so only top quality lab chow and care will do, I'm now offering surplus animals for sale. Located in far south suburbs of Chicago. Only orders of 20 or more please, no large rats will be available. For current availability and prices, please e-mail Steve at smuys@sbcglobal.net.

For sale: herp books. *Living Amphibians of the World* by Doris M. Cochran, 1961, 199 pp., 222 photos (77 in color), ex-library with extensive library markings, but clean, unmarked text, tight binding, DJ, hardbound, $14; *Encyclopedia of Australian Animals—Frogs* by Michael Tyler, 1992, 108 pp., large color photos of each species, range maps, life history data; fine condition, DJ, hardbound, $90; *Tracking the Vanishing Frogs: An Ecological Mystery* by Kathryn Phillips, 244 pp., 12 color photos, extensive bibliography, explores the declines in these amphibians, DJ, hardbound, $9; *Taipan—The World's Most Dangerous Snake* by Paul Masci and Philip Kendall, l995, 90 pp., many color and b&w photos, tables, comprehensive treatment including snakebite case histories and biology, softbound, $52. Books in excellent condition unless otherwise noted. $3 postage and handling for orders under $25, free for orders $25 or more in U.S. Subject to prior sale. William Turner, 7395 S. Downing Circle W.; Centennial, CO 80122. Telephone (303) 795-5128; e-mail: toursbyturner@aol.com.

For sale: Trophy quality jungle carpet, diamond-jungle, and jaguar carpet pythons. Website: moreliatrophyclub.com E-mail: junglejohn@tds.net.

Herp tours: **Costa Rica herping adventures**. Join a small group of fellow herpers for 7 herp-filled days. We find all types of herps, mammals, birds,and insects, but our target is snakes. We average 52 per trip, and this is our 10th year doing it. If you would like to enjoy finding herps in the wild and sleep in a bed at night with air-conditioning, hot water and only unpack your suitcase once, instead of daily, then this is the place to do it. Go to our web-site http://hiss-n-things.com and read the highlights of our trips. Read the statistics of each trip and visit the link showing photos of the 40 different species we have found along the way. E-mail at jim.kavney@gmail.com or call Jim Kavney 305 664-2881

Herp tours: **The Ultimate Bushmaster Experience**: five days in and out one of the world's hotspots, the Atlantic Rainforest in Brazil, with safety and confort, and also some work in a captive breeding center, guided by a specialist in the genus *Lachesis*. Groups of six people. Please contact Rod Souza, M.D lachesisbrasil@hotmail.com

Herp tours: The beautiful Amazon! Costa Rica from the Atlantic to the Pacific! Esquinas Rainforest Lodge, the Osa Peninsula, Santa Rosa National Park, and a host of other great places to find herps and relax. Remember, you get what you pay for, so go with the best! GreenTracks, Inc. offers the finest from wildlife tours to adventure travel, led by internationally acclaimed herpers and naturalists. Visit our website <http://www.greentracks.com> or call (800) 892-1035, E-mail: info@greentracks.com

Line ads in this publication are run free for CHS members—$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to: Michael Dloogatch, 6048 N. Lawndale Avenue, Chicago IL 60659, (773) 588-0728 evening telephone, (312) 782-2868 fax, E-mail: MADadder0@aol.com

News and Announcements

2011 CHS HERPETOLOGICAL GRANTS PROGRAM

The mission of the Chicago Herpetological Society is education, conservation and the advancement of herpetology. To further this mission, the CHS provides grants of up to $1,000 in the following categories:

1. Illinois Herpetology
2. Graduate Student Research in Herpetology
3. Undergraduate Research in Herpetology
4. Conservation
5. Captive Management, Husbandry and Propagation

The number of grants awarded in each category will depend on the grant applications received; it is possible that not all categories will receive awards and some categories may receive more than one award. The Grants Committee reserves the right to reassign the category under which a given proposal is submitted.

To qualify for a grant, the applicant must be a member of the Chicago Herpetological Society as of December 31, 2010. In accepting a grant, the recipient agrees to acknowledge the Chicago Herpetological Society in any publications or public presentations of research funded by this grant. Further, the recipient agrees to abide by all state and federal laws.

Recipients must submit a short report of their research findings to the CHS within 6 months of their anticipated completion date. The report should be written for a general audience and be suitable for publication in the CHS *Bulletin* or on the CHS webpage. This requirement may be waived if results will be published in a peer-reviewed journal within a year. Recipients may be invited to present a program at a CHS general meeting.

Applications must include the following:

1. Project title
2. Applicant's name, address, phone and email
3. Submission category
4. Introduction—Provide background for the proposed work. Include a clear statement of the objectives of the proposed work.
5. Materials and methods—Describe the study site and the materials and methods (in non-technical terms) that will be used to accomplish the objectives of the proposed research. Attach plans, diagrams and maps as necessary. Indicate whether you have an approved Animal Care (IACUC) protocol covering the proposed methods or whether you will be submitting such a protocol.
6. Applicability and broader implications—How does this work apply to conservation, education and the advancement of herpetology?
7. Budget—Indicate the budget for the entire project and make clear what portion the CHS grant money would fund.
8. Anticipated completion date for the research
9. Applicant curriculum vitae
10. Letters of support — Student applicants must include a letter of support from a faculty advisor. For non-academic individual and institutional applicants, letters of support from collaborating partners or institutions are strongly encouraged. Letter(s) of support may be emailed and should include an address and phone number at which the writer can be contacted. Letter(s) of support may also be sent by postal mail.

Proposals should be submitted as email attachments. Attachments should include the applicant's name in the file name. Proposal text should not exceed five double-spaced pages (excluding literature cited, applicant's CV, and letters of support) and should be typed using a common font (e.g., Arial, Times, Courier) no smaller than 10pt. Applications must be received by December 31, 2010, and awards will be announced by February 15, 2011.

Proposals should be emailed to grants@chicagoherp.org

Questions should be directed to Mike Dloogatch (773) 588-0728, or grants@chicagoherp.org

ReptileFest 2011, April 9, 10

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, September 29, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. **Dr. Karen L. Eckert** will speak on "Sea Turtle Conservation in the Caribbean Sea." Dr. Eckert is executive director of WIDECAST (Wider Caribbean Sea Turtle Conservation Network). Her particular area of expertise is the leatherback sea turtle, *Dermochelys coriacea*, so we can expect to learn much about that awesome creature.

The November 24 meeting meeting will include the annual election of officers and members-at-large of the CHS Board of Directors. And we'll have an interesting program as well. **Jason Hood** will speak about his experiences this past summer in the Peruvian rainforest.

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum—the **Peggy Notebaert Nature Museum**. This beautiful building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. Many CTA bus routes are within walking distance.

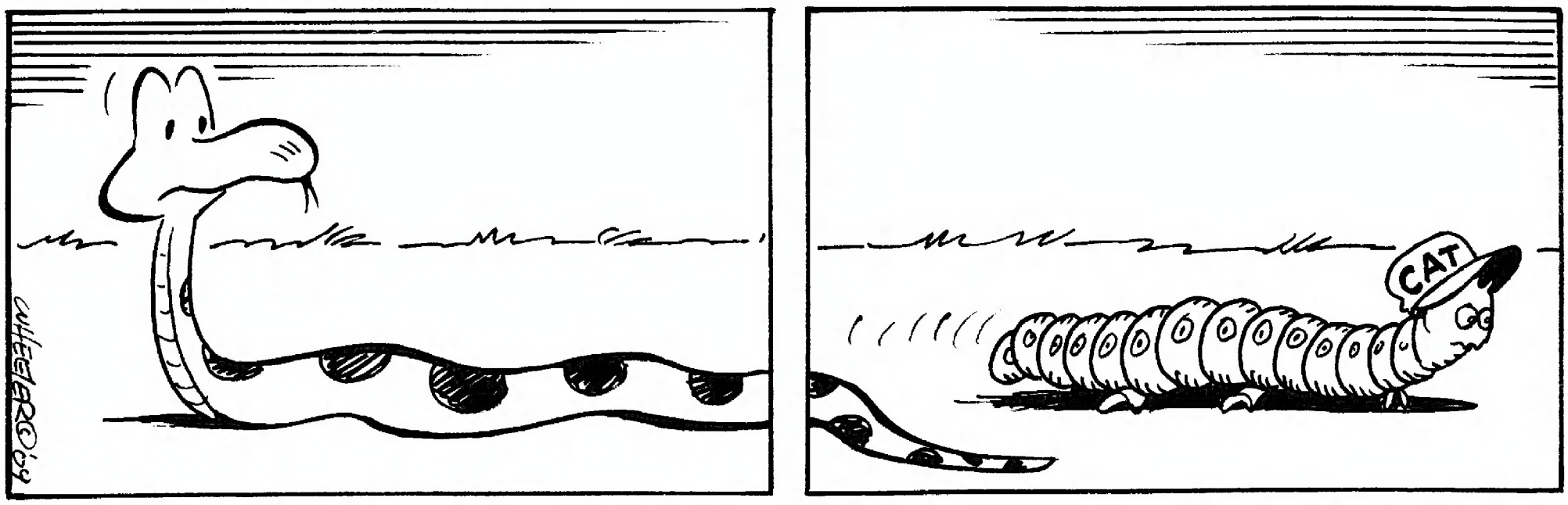
Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the next board meeting, to be held at 7:30 P.M., November 12, in the adult meeting room on the second floor of the Schaumburg Township District Library, 130 S. Roselle Road, Schaumburg.

The Chicago Turtle Club

The monthly meetings of the Chicago Turtle Club are informal; questions, children and animals are welcome. Meetings normally take place at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Parking is free. For more info visit the CTC website: http://chicagoturtle.org/.

THE ADVENTURES OF SPOT



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